

# Composition Color Space: Three Key Words in Art Design

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**Abstract.** As found in the practice of arts, which is the same as of sciences, a design without imagination is like the water running from nowhere and trees without roots, deprived of vitality and artistic appeal. As illustrated in the old saying that a thousand li journey is started by taking the first step, the three compositions work as both the foundation of art design and provider of unlimited imagination and creativity for urban design and city planning.

**Keywords:** Mechanical Engineering; Manufacturing Technology; Electrical Automation.

## 1. Introduction

The development of cities relies on the rich cultural resources which exist in the inheritance of historical culture. Higher education shoulders a double responsibility of passing down the historical culture and artistic and aesthetic education. It also has the historical mission of the promotion of cultural development in cities and urban revitalization. Urban revitalization needs economic and cultural revitalization and the improvements in city appearance and overall city environment. Those depend on both city planning and city colors and space design. The three major compositions in college artistic and aesthetic education---- color composition, plane composition, space composition--- all encompass the specific contents in collaborative innovation mechanism. The three major compositions are the foundation of design and urban revitalization and development. In recent years, some people also referred to them as the foundation of composition, or the foundation of design. Whatever they were named, the meanings are the same, and all design majors have to study them. They make up the obligatory basic courses for visual communication majors, in which students learn the methods and principles in composition. In such course, students will learn composition principles, the composition of point, line, and plane, color matching, 3D modelling and structure. All these can be applied to the assistance of urban revitalization and development.

### 1.1. Art Design and the Three Major Compositions

The fields of study in art design

Art design is an interdisciplinary subject, covering politics, economy, culture, society, science, technology, education, marketing, and so on. The aesthetic standards and values have been changing with many elements such as environment and times. Art design, at its core, is the comprehensive representation of the designer's imagination, creativity, and expressiveness. At the same time, art design is an independent discipline of arts, encompassing graphic design, visual communication, environment design, product design, and others.

### 1.2. The Fields of Study in the Three Major Compositions

To begin with, plane composition is the foundation of visual design. It is mainly about the principles of composition with such basic design elements in 2D dimension as point, line, and plane. The core of the study is the semantic representation of point, line, and plane, as well as their variations in size, density, and space. These variations and principles have to follow the basic rules in formal beauty to provide any viewer with the appeal of formal beauty and the edification of artistic beauty.

As the students proceed in art design learning, they will study space composition built on the plane composition, and the focus is the visualization in 3D. What is common between space and plane composition is the same elements to be studied, which are point, line, and plane, and which follow

the same principles in the variations in size, density, space, curving, and so on. The difference lies in the dimensional representation. Since the elements turn into being solid and materialized, people may be able to experience and be immersed into them, as indicated in the ancient stanza reading “Of Mountain Lu we cannot make out the true face, for we are lost in the heart of the very place.”

Last but not least, color composition is dedicated to bringing in appropriate colors on the basis of plane and space composition, focusing on the property, classification, hue, saturation, and brightness of colors as well as the tonality. Color tones can be classified into warm, cold, slightly warm, and slightly cold tones. Built on that classification, the value of color can be classified into high, middle, and low value and consequently nine subtypes of value contrast. The three major categories of value are high value basic tone, middle value basic tone, and low value basic tone. The nine subtypes of value contrast include high value long tone (high value basic tone with strong contrast), high value middle tone (high value basic tone with mild contrast), and high value short tone (high value basic tone with weak contrast). The tonality based on saturation and hue can also be classified into three major types and nine subtypes. Such classification encompasses all the kinds of tonality. The mastery of color composition paves the way for solving color problems in visual communication, fashion design, advertisement design, environment design, and product design.

### **1.3. The Relationship between Art Design and the Three Major Compositions**

Art design interacts with three major compositions. They are interdependent upon and influence each other in every way ranging from part-whole fashioned interaction to merging into each other. Art design is the final product on the basis of compositions for people to appreciate, invest in, and use, playing a role in dissemination, promotion, directing, and resonance. Each product of art design is perceived as the whole while compositions in it as part, with the latter is subject to and constitutes the former. Only the harmony between the part and whole makes perfect art design. The plane composition provides the framework for art design, like the plan map for a park. The position of point, line, and plan, the variations in density and size, the corresponding relationship of the subject and object, all need to be identified on the map. Next, space composition deals with the depiction in 3D space. At last, the colorization and color matching finish the work of the construction of park. Therefore, art design cannot be rid of the arrangement of point, line, and plane, integration of materials, and reasonable color matching in the three major compositions.

## **2. The Education and Practice of the Three Major Compositions**

### **2.1. The Education and Practice of Plane Composition**

The plane composition is defined as the arrangement, disintegration, and combination of the visual elements in the flat 2D space, based on the rule of formal beauty, to achieve ideal visual art expression. It is the foundation course in design. Its education is embodied by the content represented by point, line, and plane. In educational practice, the first thing to do is the arrangement of point, line, and plane, which will involve all the elements and their reasonable combinations in terms of size, density, contrast, space, homogeneity, and rhythm, to keep the visual balance. Second, the characteristics in repetition composition should be emphasized to help the students to understand how the same basic forms are arranged regularly by following certain frame to form new forms as a method in design. Third, a group of basic forms can be developed according to certain requirements, and arranged with certain regularity. With thorough consideration and comparison, a new desirable image will be decided. That is so called grouping composition as an expression method. Grouping composition is also used in logo design. Forth, the students will need to learn the differences and relations among, and features and methods of optical illusion, contradictory space, peculiarity, marbling, space division in composition. These can be used to create highlights, efficiency, and creativity in art design process. In the process of learning plane composition, the key for assessment is the principles of composition of point, line, and plane, while the challenges are repetition, grouping, and peculiarity. The assessments in the course cover the fundamentals, the compositional relationship, compositional

methods, and variational features of point, line, and plane, as well as the application of plane composition principles in design practices. The students will master basic skills, including repetition, grouping, and peculiarity. Here are some further explanations for the skills. Repetitional composition is the combination of the same elements based on certain pattern in forming a new image. Grouping composition is the arrangement of the same basic forms based on certain pattern, producing one row, or two, or three, or more, to form aesthetically pleasing and complex image. It should be warned that what is desirable is an image with not too much complexity but aesthetical simplicity, which can be a logo, or an independent image. Grouping is one of the most commonly used methods in logo design. Peculiarity refers to a peculiar image. A combination involving peculiar images requires contiguity. For example, imagine that we are designing a group of pictures of cat. Since we know cats love eating fish, we can put fish in the middle of, or somewhere among the cats. Then we have the peculiar image which is the fish. Or we can imagine to design a group of flower buds. In the middle of them we can put a flower that has blossomed. The latter is a peculiar image for the buds. The contiguity of the buds and the flower illustrates the process of blossoming that starts with the buds. These examples illustrate that we need to take into consideration various elements that are related in order to complete a design. Therefore, the result is produced by a process of thinking, comparison, and further comparison.

Plane composition, as the foundation of composition, is dedicated to solving the key problems in point, line, and plane. The concepts of point, line, and plane require objectivity to understand its real meaning. The so-called point, line, and plane, present themselves in the forms as their names indicate. However, the literal understanding of the names can be misleading. For example, in an aircraft carrier we can find planes, lines, and points. Compared with the vast sea, the same carrier is nothing more than a point in this regard. We now can understand what is the true meaning of a point. The same understanding can be applied to the concepts of line and plane. Therefore, only through the comparison or contrasting in different environments can we understand the true meaning of point, line, and plane. In a design, we need to decide the positions of point, line, and plane according to the size of the picture. All the three of them should be arranged reasonably in a picture since a complete picture will not be short of any of them. The integration of all of them makes a complete design. The addition of colors and words to the arrangement of point, line, and plane, brings us a complete work. The plane composition, as the compositional foundation, is the most basic compositional element in design composition, like the foundation of a tall building. Therefore, it is necessary to master plane composition. In fact, the appropriate combination of point, line, and plane, the appropriate application and expression of color, and reasonable typography in a visual communication work, will work together to achieve the quality of a work and determine how far it can go. Plane composition is highly rhythmic. In professor Di Lifeng's oil painting series Imperial Family, there are the sublime dignity of royal family, the morbidezza seen in the royal women, and the imposing manners with both "mountainous grandeur and river's delicacy", which present a quality of simplicity and a melody of vitality.

In all, plane composition is an important theoretical foundation of modern visual communication design. The plane composition in city planning covers the layout of urban environment and façade design. The elements and principles of point, line, and plane are used to bring innovation to urban designing, forming new design concepts and various products. All these are achieved through plane composition.

## **2.2. The Education and Practice of Space Composition**

The soul of space composition is plane composition. Space composition is employed to transform the 2D images of the point, line, and plane in plane composition into 3D images of linear, planar, and mass materials through processing methods. Space composition is interchangeably called 3-dimensional composition. It is a kind of modelling art based on concrete images, imagination, or abstract images, works with the laws and principles of formal beauty, and depends on certain

materials as it uses compositional methods to create new forms with modelling elements. It serves to satisfy people's demand for beauty.

Just as points join together in a linear fashion to create a line, the course of the movement of a line makes up a plane which has length and width. In the same way, the course of the movement of a 2D plane forms a 3D image. First, the students will work with the production and training of linear materials. The materials can fall into two categories: the soft and the hard. The soft lines include jute rope, nylon rope, soft metal line, and so on. Those materials need hard materials for support. People refer to the soft material compositional works as "soft sculpture". Hard materials include wooden strip, glass strip, metal strip, plastic pipe, benzene strip, and so on. Only through processing, pasting, combination, and other methods, can they turn into aesthetical spatial compositional works. Second, students will need to learn the production of planar materials and practice. They will create spatial material works through straight line bending, curved line bending, straight and curved cutting (somewhere bent and somewhere broken), and other methods. Third, students will learn mass materials production and practice. Mass materials, in comparison with linear materials, have the length and the width closer to each other as well as structures expanding in all directions, such as brass, iron, aluminum, benzene slabs, wood, sculptures, plaster, modern decoration materials, and so on. The shapes of mass materials include cube, sphere, irregularity, and others. The major ways of processing of mass materials are similar to those of producing linear ones, such as cutting, soldering, agglomeration, biomimetics, and others. The works with practical and aesthetic value have met the growing demands in physical and cultural goods consumptions. In the learning of space composition, the keys in assessments include the students' understandings about point, line, and plane, and their compositional principles in 3D. The challenges lie in the basic knowledge of the compositional principles of 3D linear, planar, and mass materials, as well as the mastery of skills and methods in the combinations of linear, planar, and mass materials in all kinds of shapes. Those make up the foundation for further learning in packaging design, product design, fashion design, and other related subjects, and also help the students to apply the knowledge in as many design practices as they can.

After all, the point, line, and plane in space composition are no more than 3D forms, and have close relationship with the arrangement of those in plane composition. The point, line, and plane in plane composition exists in 2D, and those in space composition in 3D. In design, as long as we stick to the compositional principles and aesthetic requirements of point line, and plane, we will certainly complete the design, arrangement, and combination of point, line, and plane in 3D to achieve the most desirable 3D effects in. 3D composition is mostly about using the basic principles and methods in 2D composition to create a 3D design. Just like in the construction of a tall building, people use concrete bricks and other materials to build on the foundation. The plane and space compositions of this tall building make up the framework and main part of construction. In construction, a framework is essential. And the addition of appropriate colors will contribute to the completion of the building.

Space composition should not be underestimated in urban development and construction. There are three reasons for that. First, the various and visually pleasing appearances of architectures can bring stronger sense of depth to urban space, enriching the spatial forms and highlighting the key zones. Second, space composition can better meet the demands from economic development and construction. For example, in large shopping plazas and public spaces in a city, space design can increase commercial area to accommodate more people. Third, space composition can bring more aesthetic elements into city landscape to enhance the visual impact and artistic value with the help of construction materials and architectural forms. At the same time, appropriate space composition can contribute to optimizing city traffic, increasing vitality, and enhancing attraction. Forth, many cities are home to rich historical cultures. Appropriate design in space composition, and architecture colors and forms, combined with local cultural elements, can present the city's charm in an appropriate way. For example, the construction of pseudo-classic architecture in the planning of the zones of historical relics can work well in preserving and manifesting traditional historical culture, also functions as a new development of cultural heritage.

### 2.3. The Education and Practice of Color Composition

Color composition refers to the aesthetic compositional methods for the redesigning, combining, and orchestrating two or more colors, for particular purposes, in accordance with the principles in color relationship. What must be addressed is the basic knowledge of colors, including the relationships between colors and light, colors in nature and those in paintings, the psychological and physiological influence that colors give to people, and so on. In the training with colors, the students need to stand upon the shoulders of the pioneers, using Munsell color system, color wheel theory, and three primary colors, to master the expressive methods in color composition, those with the value as the core, those with the chroma as the core, and including those with the hue as the core, and are able to express the color compositional content which consists of the three major types of tone and the nine subtypes for expressing value, chroma, and hue.

Everything has both positive and negative aspects. So is color tonality. The representational meanings of the three basic tones in color value are as follows. First, the positive representations of high value basic tone can be lucidity, clarity, enthusiasm, liveliness, and enjoyment, while the negative ones can be apathy, feebleness, helplessness, and withdrawal. The middle value basic tone can positively represent simplicity, tranquility, maturity, and unadorned solemnity while, negatively, poverty, dullness, negativity, and laches. The low value basic tone can positively symbolize fortitude, bravery, stoutness, and probity, while negatively darkness, treacherousness, and distress, which are often seen in a grey and dark movie images. Second, the symbolic meanings of the three basic tones of chroma are as follows. High chroma colors in basic tone can positively symbolize joy, liveliness, fuss, and cleverness, while negatively, terror, shock, hazard, and atrocity. Middle chroma colors of basic tone can positively represent moderation, reliability, steadiness, and elegance, while negatively, murky gray, negativity, fragility, and worry. Low chroma colors of basic tone can positively symbolize durability, quietness, and being celestial, while negatively, provincialism, ambiguity, pessimism, and dismay. According to the facial characteristics of colors, we can also develop the positive and negative symbolic meanings of hues. With the symbolic meanings of value, chroma, and hue, we can design the artworks that have aesthetic value, are sensitive to times, and also meet clients' requirements. The assessment criteria of color composition have its key points which are the accurate application of the three major tones and the nine subtypes, and its challenging points which are the applications of color tonality in design practices. At the same time, the students are required to master color value chart, the three major types of color tones, the nine subtypes, hues, brightness, chroma, decorative coloration, and the application of basic color knowledge and skills.

“There is still a long way to go in terms of the individualized teaching, knowledge expansion, and the realization of true differentiated teaching that is supposed to be based the student backgrounds” [2]. As we know, color composition is actually the combination of colors and tones. People will add the colors they like to the foundation built in plane and space compositions. The coloration depends on reasonable matchings of tones. We know there are four basic tones, warm tones, slightly warm tones, cold tones, and slightly cold tones. We need to show the facial characteristics of colors on the basis and demands of specific design projects. Specifically speaking, every color has its own facial characteristics and symbolic meanings. Different colors have different symbolic meanings, which will certainly have corresponding effects on people physiologically and psychologically. Therefore, with the integrated and scientific design framework built on plane and space compositions and their combination with appropriate coloration, we basically complete the combination of design elements, and the design task. Up to this point, we will have had laid a solid foundation of theory and practice for the complete expression of visual communication design. There is a tendency to produce brightness effects through colors. German artist Peter Paul Rubens had a huge number of works which cover many genres including religious painting, mythological painting, history painting, genre painting, portrait, landscape, animal painting, and so on. All these works please people with their bright colors. “He mixed the magnificent and splendid Baroque art style with the ethnic art of Netherlands, forming a unique style with romanticist tendency. His works have vivid images and bright colors, highly decorative and with surging momentum [3]”. The reasons for such brightness

effects are as follows. First, urban colors are those most easy to appeal to people visually and strongest in drawing the attention. Second, urban colors are among those that are best in reinforcing the recognition and memorization in people. Colors are not only easy to recognize but also helpful in creating and refreshing memories, bringing up repeated urban ‘consumption’ effect. For this reason, in order to highlight a city’s features, the choice of colors should be given a priority over any other elements. Third, colors are stimulating and can affect moods. Colors have a direct influence on our emotions and actions through visual impact. Studies about colors have found that people in environments of different colors have different physiological and psychological reactions. Last, color can convey ideas and meanings. Even a highly complicated or abstract thing can be turned into something easy to understand through color processing. In the designs for city, image colors or trending colors are used on a large scale because of this.

In all, design basics are especially important. The visual communication design without composition as foundation would be like water without source, tree without roots, or a building without foundation. Therefore, we must put emphasis on design basics and strengthen them. In specific design practices, we should make sure the basics are in place, to serve the future design, for the improvement of art aesthetic education in higher education, and to assist the urban revitalization and development.

Cities have developed as human civilizations progress and become important living and working places. The overall capacity of a city lies not only in highly developed economy, but also in the urban landscape. A city’s appearance is its unique characteristics formed in the city’s historical development, reflecting the city’s spatial and landscape features, presenting a city’s elegant mien and overall strength. All these can’t be separated from the art aesthetic education in higher education, the achievements and contributions of which are mainly demonstrated in a city’s appearance, sustainable environment beautification, architecture, visual advertisements, and so on. For example, the team ‘Art Aesthetic Education’, equipped with their specialty in art and design, from Liaoning Communication University, completed an innovative project in early 2017 for Shenbei New Area. The project featured “wrapped subway cars” in Shenyang, which was aimed at presenting the ecological beautiful scenes of Shenbei New Area in the subway cars, for a cultural subway project called “Shenbei Special Subway”. It took three months to bring out a new design and change the look of subway cars. When people enjoy the convenient subway trips, they also have the chances to enjoy a visual feast of art aesthetic education. In addition to this, the team has also worked on the ubiquitous visual communications carried out in streets, through indoor and outdoor billboards, neon advertising signs, and show window display in Shenyang. These are the fruits of art aesthetic education in higher education, and examples of how the meaning that art aesthetic education in higher education assists urban revitalization is defined. There are many successful examples of art aesthetic education in colleges and universities all over China. The credit of these successes should go to the solid foundation laid by the three key words in art design: composition, color, and space.

### **3. Conclusion**

The development of a city cannot go without art aesthetic education in higher education. The three compositional knowledge are catalyzers for urban revitalization. At the same time, the three compositions are the basic courses for art design majors, focusing on fostering abstraction and generalization abilities and creativity with concrete images. As said by Einstein, “imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution.” Art is the same as science. A design without imagination is the same as water without a source and a tree without roots. The final product of such design is lifeless, and lack of art appeal. A thousand li journey is started by taking the first step. The three compositions provide strong support of imagination and creativity for art design and lay a solid foundation for the edifice of design. In the teaching and practices of the three major compositions, a teacher needs to help the students to fully understand and master the abstract theories through concrete practices. Those contents should especially cover the specific content represented by the abstract symbols of point, line, and plane in plane composition, the symbolic meanings of the new images

formed by linear, planar, and mass materials after being processed in space composition, and the abstract and concrete symbolic meanings represented by the facial features of hues and the meanings of tones in color composition. These abstract concepts cannot be understood if they are only taught through lectures, not to mention of the full mastery of them. Therefore, the abstract concepts must be combined with a large number of practical cases when a teacher teaches them. Effective, repeated, and interesting practices must be involved to help the students learn and innovate.

The purpose of teaching and practical training of composition, color, and space, the three key words and key elements in design, is to enrich the design language and the imagination and creativity in modeling design, in students as much as possible. The teaching of these concepts aims to help the students to acquire the design methods which combine rationality and emotion, extend design thinking, and enhance aesthetic ability, creativity, design ability, and application ability. The three major compositions are not the same as ordinary drawing of graphics and design, but an aesthetic design process with an overall reasonable layout featuring principles, abstraction, and generality. We have reasons to believe that the three compositions which embody the content of art aesthetic education can provide indispensable new blood to the urban development and construction because city planning cannot go without visual aesthetics. The colors in cities cannot work with people's visual aesthetic demands for harmonious colors. The scale and massiness of a city cannot go without people's experience of the city's modelling design style and comfort. Composition·Color·Space ---- - the three key words almost cover and elaborate all the contents of modern urban development and construction. Therefore, art aesthetic education in higher education is an effective method and means for assisting urban revitalization and coordinated innovation mechanism.

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